DEPARTMENT OF MENTAL HEALTH

PARAMETERS 3.8 FOR USE OF PSYCHOTROPIC MEDICATION IN CHILDREN AND ADOLESCENTS

Treatment provided outside the parametric elements in this guide requires special justification or consultation and subsequent documentation in medical record.

December 17, 2014

INTRODUCTION

The parametric elements of this guide are the dose range and dosage schedule.

DMH Parameters 3.8 For Use of Psychotropic Medication for Children and Adolescents, is designed for the use of psychoactive medications for the treatment of mental disorders in children and adolescents, ages birth to seventeen, who receive treatment by either directly-operated Los Angeles County Department of Mental Health clinics and the Department's contracted agencies. (A companion set of parameters regarding the use of psychotropic medications for the treatment of mental disorders is available at http://dmh.lacounty.gov/wps/portal/dmh/clinical_tools/clinical_practice and should be used in conjunction with these parameters.) The intent of this document is to provide a framework for quality management relating to the major classes of psychoactive medications used in children and adolescents. Also, this document serves as a framework by which to develop departmental sponsored training and education for its staff and others.

This document represents a consensus of best practices from among various experts from local training institutions and experienced community based clinicians who provide treatment to children and adolescents. It is updated periodically to reflect improvements in evidence based treatments. It is not intended to be a comprehensive treatment document. There are various source documents that may serve as such. These include publications by the American Academy of Child and Adolescent Psychiatry among other medical organizations. Clinicians are expected to be familiar with these publications.

Treatment provided outside of the parametric elements in this guide requires special justification and/or consultation and subsequent relevant documentation of the rationale. Changes in current medication regimens made for the purpose of conforming with this Guide should be initiated only after careful clinical consideration of the basis for the current medication regimen. Treatment noncompliance is a special situation that must be addressed by the prescribing physician; the general health risks inherent in this situation must be considered and the nature and outcome of such deliberations must be clearly documented in the medical record.

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CONVENTIONAL ANTIPSYCHOTIC

A. Clinical Indications For Use:

1. psychosis
2. mania
3. Tourette's d/o
4. * 2^{o} use in severe behavior d/o with aggression
5. * 2^{o} use in severe hyperactivity

B. Frequency of Dose Change:

As clinically indicated

C. Concomitant Medication Use:

1. Tegretol etc. may lower plasma level
2. avoid >1 antipsychotic at a time
3. avoid anticholinergics with thioridazine

D. Complications & Side Effects:

1. EPS
2. tardive dyskinesia
3. NMS
4. sedation
5. cognitive dulling
6. lowers seizure threshold
7. weight gain
8. hyperprolactinemia**

E. Cautions/Contraindications:

1. liver disease
2. respiratory distress
3. pregnancy
4. breast feeding
5. allergy to drug

F. Medical Work-up:

1. physical exam (incl. HT, WT, BP, P, dyskinesia)
2. lab: fasting serum glucose, fasting lipid panel, LFT's, CBC+differential, UA, BUN, creatinine
3. check for abnormal, involuntary movements

G. Medical Follow-up:

1. for each visit: abnormal movements
2. with each upper titration: BP, P
3. every 6 mos: AIMS, weight, LFT's
4. annual: PE, chemistry panel, CBC+differential, UA
5. for pimozide: EKG @ dose ↑, liver enzymes q3mos
6. for thioridazine: periodic EKG's and serum potassium level

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS	CONTRAINDICATIONS
chlorpromazine (Thorazine)	psychosis	10 - 800	2-3 x/d	higher risk of sedation/hypotension	see class
thioridazine (Mellaril)	Only for schizophrenia after other antipsychotics are ineffective	10 - 800	2-3 x/d	higher risk of sedation/hypotension; retinitis pigmentosa	Congenital QT syndrome; QTc interval over 500 msec; cardiac arrhythmias; use of fluvoxamine, propranolol, pindolol, fluoxetine, paroxetine, agents that prolong QTc interval
fluphenazine (Prolixin)	psychosis	1 - 20	2-3 x/d	-	see class
perphenazine (Trilafon)	psychosis	2 - 20	2-3 x/d	-	see class
trifluoperazine (Stelazine)	psychosis	1 - 20	2-3 x/d	-	see class
haloperidol (Haldol)	psychosis	0.5 - 20	2-3 x/d	-	see class
thiothixene (Navane)	psychosis	1 - 50	2-3 x/d	-	see class
loxapine (Loxitane)	psychosis	5 - 150	2-3 x/d		see class
pimozide (Orap)	Tourette's Disorder	1 - 10	1-2 x/d	conduction delays ↑liver enzymes	hx of arrhythmia & use of other drugs that ↑ Q-T

* *When standard treatments have been tried and have failed or are contraindicated.* ** *More so than novel antipsychotics.*

NOVEL ANTIPSYCHOTIC

A. Clinical Indications For Use:
1. psychosis
2. bipolar, mania
3. severe behavior d/o with aggression
4. * 2^{o} use in severe hyperactivity

B. Frequency of Dose Change:
As clinically indicated

C. Concomitant Medication Use:
1. Drugs that lower plasma level: carbamazepine (CBZ), phenytoin (PHT), phenobarbital (PB), smoking
2. Drugs that increase plasma level: fluoxetine, fluvoxamine, paroxetine, macrolide antibiotic, cimetidine
3. Avoid >1 antipsychotic at a time

D. Complications & Side Effects:
1. sedation or cognitive dulling
2. weight gain/obesity; DM type 2; metabolic syndrome
3. dyslipidemia, hyperprolactinemia
4. NMS, TD, withdrawal dyskinesis, EPS

E. Cautions/Contraindications:
1. liver disease, respiratory distress
2. pregnancy & breast feeding
3. avoid concurrent med that ↑QTc (ziprasidone)
4. myelosuppression, uncontrolled seizure disorder (clozapine)

F. Medical Work-up:
1. physical exam (incl. HT, WT, BMI, BP, P, dyskinesia)
2. lab: fasting serum glucose, fasting lipid panel, LFT's, CBC+differential, UA, BUN, creatinine
3. check for abnormal, involuntary movements
4. baseline EKG (ziprasidone)

G. Medical Follow-up:
1. each visit: dyskinesias
2. each upper titration: BP, P
3. at least q 2 mos: wt
4. every 6 mos: abnormal, involuntary movements, weight, LFT's (Risperdal and Zyprexa), fasting serum glucose, fasting lipid panel
5. annual: PE, CBC+differential, UA
6. for clozapine: Per Protocol
7. for ziprasidone: repeat EKG after increases
8. if rapid weight gain, high risk for DM, and/or below age 7: more frequent monitoring

Adverse effect likelihood from highest risk to lowest risk:	
	• Diabetes/hyperlipidemia, sedation risk: Clozapine = olanzapine > quetiapine > risperidone > aripiprazole > ziprasidone
	• Hyperprolactinemia and EPS risk: Paliperidone = risperidone > olanzapine > ziprasidone > aripiprazole > quetiapine
	• Orthostatic hypotension risk: Clozapine > risperidone = quetiapine > aripiprazole > ziprasidone

DRUG Available dosage forms (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS
olanzapine (Zyprexa) tablet (do not crush), rapid-dissolve tab, IM	Psychosis Bipolar disorder	2.5 - 20	1-2 x/d	weight gain,↑ lipids, ↑ prolactin ↑ glucose, tachycardia, restlessness,	high risk of weight gain, diabetes, and hyperlipidemia
quetiapine (Seroquel) tab that can be crushed XR cannot be crushed	Psychosis Bipolar disorder	25 - 800	1-2 x/d XR 1 x/d	weight gain,↑ lipids, ↑ glucose	least EPS/↑ prolactin, moderate hypotension
risperidone (Risperdal)** scored tab(crushable), rapid-dissolve tab, soln	Psychosis Bipolar disorder Aggression/irritability in Autistic D/O	0.25 - 8	1-3 x/d 1-2 x/d	weight gain,↑ lipids, ↑ prolactin, ↑ glucose, tachycardia, restlessness	highest EPS, highest ↑ prolactin, moderate hypotension
clozapine (Clozaril) tab, rapid-dissolve tab (Fazaclo)	Rx resistant psychosis, Bipolar disorder tardive dyskinesia, severe EPS	12.5 - 450	1-2 x/d	agranulocytosis, seizures, constipation, hypotension, salivation, wt gain, tachycardia, myocarditis ↑ lipids, ↑glucose,	↑ weight gain, diabetes/hyperlipidemia high sedation, high hypotension, tachycardia, resp. depression
ziprasidone (Geodon) capsule, IM	Psychosis Bipolar disorder	20 - 160	1-2 x/d	prolongation of QTc;	nausea, headache, least wt gain, low EPS low hypotension/sedation,
aripiprazole (Abilify) tab, solution, rapid-dissolve, IM	Psychosis Bipolar disorder Aggression/irritability in Autistic D/O	2 - 30	1 x/d	nausea, vomiting weight gain, restlessness psycho-motor activation	nausea, EPS, hypotension & sedation
Paliperidone (Invega) ER tablet (Do not crush)	Psychosis	3-12	1 x/d	Weight gain, hyperprolactinemia, somnolence, tachycardia, akathisia, dystonia, cogwheel regidity	≥51 kg 3 mg/d; max 12 mg/d <51 kg 3 mg/d; max 6 mg/d

* *When standard treatments have been tried and have failed or are contraindicated* ** *May be used for Tourette's*

LONG-ACTING ANTIPSYCHOTIC INJECTIONS

A. Criteria For Use:

1. must demonstrate positive response and tolerability to oral form of medication
2. no history of NMS
3. maintenance antipsychotic therapy
4. prevention of non-compliance related relapse
5. effective medication delivery (if oral/GI delivery is not feasible)
6. insufficient data to support safe use under age 18

B. Frequency of Injection:

see each medication frequency/Indications

C. Concomitant Medication Use

1. drugs that lower plasma level: carbamazepine(CBZ), phenytoin(PHT), phenobarbital(PB), smoking
2. drugs that increase plasma level: Fluoxetine, fluvoxamine, Paroxetine, Macrolide Antibiotics
3. avoid >1 injectable antipsychotic therapy at a time

D. Complications & Side Effects:

Immediate

1. sedation or cognitive dulling
2. hypotension, dizziness
3. injection specific complications (sore, scars, infection at injection sites etc.)

Long Term

1. NMS, EPS, TD
2. weight gain /obesity / diabetes mellitus II
3. dyslipidemia, hyperprolactinemia

E. Cautions / Contraindications:

1. allergy to sesame oil (Haldol Decanoate, Prolixin Decanoate)
2. liver disease
3. respiratory distress
4. pregnancy & breast feeding
5. avoid concurrent medications that increase QTc interval
6. fever of unknown origin (need to r/o NMS)

F. Medical Work-up:

1. physical exam (incl. Ht, Wt, BP, P, dyskinesia)
2. lab: fasting blood glucose, fasting lipid panel, CBC, LFT, UA
3. EKG (for haloperidol & fluphenazine); repeat when therapeutic dose is established
4. check for abnormal involuntary movements

G. Medical Follow-up:

1. each visit: dyskinesia, vital signs (BP, pulse)
2. every 6 months: abnormal involuntary movements, weight, LFT's; fasting glucose & lipid panel
3. annual: PE, CBC, kidney function

Medication	Base / Form	Strength supplied	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	Peak Plasma Level
haloperidol decanoate	esterified with decanoic acid, (sesame) oil base	50mg / ml 100mg / ml	50 - 200	4 weeks	similar to oral haloperidol drowsiness, insomnia, EPS, (less often than oral form), inflammation & nodule at injection site (less common if deltoid used and lower concentration is used)	3-9 days
fluphenazine decanoate; piperazine phenothiazine	esterified with decanoic acid, (sesame) oil base	25mg / ml	12.5 - 40	2-4 weeks	similar to oral fluphenazine drowsiness, insomnia, EPS (more frequent with decanoate- up to 50%), dermatological reaction been reported, EKG changes in some patients, hematologic changes within normal variation	first peak at 24 hr, then peaks again in 8-12 days
Risperdal-Consta *must draw up entire vial	encapsulated microspheres, aqueous base	12.5mg / vial 25mg / vial 37.5mg/vial 50mg / vial	12.5 - 50	2 weeks	similar to oral risperidone drowsiness, insomnia, anxiety reported. akathisia & parkinsonism (7%), hypotension, hyperkinesia (12%), pain, redness, swelling at injection site (<5%)	1% released immediately, the main release begins 3 weeks. Peaks Plasma level in 4-6 weeks

ANTIPARKINSON / ANTICHOLINERGIC

A. Clinical Indications For Use:
medication induced extrapyramidal dysfunctions (Parkinson's syndrome, dystonia, akathisia, dyskinesia)

B. Frequency of Dose Change:
1. as clinically indicated
2. may be withdrawn after a few days to 3 months of use to observe for EPS and assess need for use.

C. Concomitant Medication Use:
1. use only one of this class at a time
2. avoid use with other parasympatholytic agents (TCA's, low potency antipsychotics)

D. Complications & Side Effects:
1. confusion, disorientation, delirium, hallucinations, cognitive dulling, impaired memory
2. constipation, ↓ visual accommodation, tachycardia, xerostomia, pupilary dilatation, flushed-dry-hot skin, headache, coma, death
3. worsening of pre-existing psychotic symptoms
4. aggravation of asthma
5. abuse potential: may produce a “buzz”
6. hyperthermia

E. Cautions/Contraindications:
1. age < 3 y/o
2. exposure to heat, severe physical stress
3. closed angle glaucoma
4. obstructive bowel d/o, megacolon

F. Medical Work-up:
1. see work-up for antipsychotics
2. history of asthma

G. Medical Follow-up:
see follow-up for antipsychotics

DRUG (One common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
benztropine (Cogentin)	0.25 - 6	1-2 x/d	available by injection
trihexyphenidyl (Artane)	0.50 - 6	2-3 x/d	abuse potential

ANTIHISTAMINE

A. Clinical Indications For Use:
1. Anxiolytic/sedative/hypnotic
2. allergic reactions
3. motion sickness

B. Frequency of Dose Change;
- ♦ daily as indicated

C. Complications & Side Effects:
See Antiparkinson / Anticholinergic

D. Concomitant Medication Use:
1. avoid use with other parasympatholytic agents (TCA's, low potency antipsychotics)
2. avoid MAOI's
3. potentiates barbiturates, alcohol, tranquilizers, opiates

E. Cautions/Contraindications:
1. See Antiparkinson / Anticholinergic
2. age < 1 y/o

F. Medical Work-up:
1. physical exam (incl. HT, WT, BP, P,)
2. lab: chem. panel, CBC+diff, UA, T_4, TSH
3. check history of asthma

G. Medical Follow-up:
1. annual PE, SMA, CBC
2. anemia, infections, easy bruising

DRUG (One common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
diphenhydramine (Benadryl)	12.5 - 150	1-4 x/d	tablet, capsule, liquid, IM or IV
hydroxyzine pamoate (Vistaril) hydroxyzine HCl (Atarax)	12.5 - 300	1-4 x/d	capsule, tablet, syrup

PSYCHOSTIMULANT

A. Clinical Indications For Use:

1. Attention-Deficit/Hyperactivity Disorder
2. attention deficit symptoms associated with other mental disorders

B. Frequency of Dose Change:

- No more than two (2) changes in any 7 day period.

C. Concomitant Medication Use:

1. Only one psychostimulant at any one time.
2. No heterocyclic antidepressant unless trials of individual meds have failed
3. No MAO inhibitors

D. Complications & Side Effects:

1. agitation, irritability, hyperactivity
2. exacerbation of obsessions and compulsions
3. insomnia, decreased appetite, weight loss, delayed growth
4. increased heart rate & blood pressure
5. agitation, irritability
6. dyskinetic movements/tics
7. depression or psychosis in high doses
8. withdrawal effect or rebound phenomena

E. Cautions/Contraindications:

1. alcohol or drug abuse
2. anorexia nervosa
3. psychoses
4. severe anxiety
5. hx of cardiovascular disease or family hx of cardiovascular disease, including structural heart defects, or unexplained sudden death

E. (cont) Cautions/Contraindications:

6. thyroid disease
7. glaucoma
8. pregnancy & breast feeding
9. allergy to the drug

F. Medical Work-up:

1. physical exam (incl. Ht & Wt on graph, BP, pulse, dyskinetic movements/tics)
2. chemistry panel, CBC+differential, urinalysis, TSH
3. EKG at baseline if positive cardiac risk factors

G. Medical Follow-up:

1. weekly (or at each visit): BP, pulse, dyskinesia check
2. periodic: height & weight (graph)
3. annual: physical exam, chemistry panel, CBC+differential, urinalysis

DRUG (One common brand name is indicated for convenience. No preference is implied.)	DURATION OF EFFECT	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
SHORT ACTING				
dextroamphetamine (Dexedrine, Dextrostat, Liquadd)	4-5 hours	2.5 - 40	1-3 x/d	Liquadd avail in liquid form
amphetamine salts (Adderall) *	4-5 hours	2.5 - 60	1-3 x/d	-
methylphenidate (Ritalin, Methylin, Metadate)	4-5 hours	2.5 - 60	1-3 x/d	Methylin avail in liquid form
dexmethylphenidate (Focalin)	3-5 hours	2.5 - 40	1-3 x/d	-
INTERMEDIATE ACTING				
methylphenidate (Ritalin SR, Metadate ER, Methlyn ER)	6-8 hours	2.5 - 60	1-2 x/d	Must be swallowed whole
methylphenidate (Metadate CD)	8-9 hours	10 - 60	Once daily	Sprinkle on food as long as bead swallowed whole
methylphenidate (Ritalin LA) - capsule	8-10 hours	10 - 60	Once daily	Sprinkle on food as long as bead swallowed whole. High fat food may delay absorption
LONG ACTING				
methylphenidate patch (Daytrana)	as long as patch applied + up to 3 hours	10 - 30	Once daily for 9 hrs	Skin irritation, remove after 9 hours
methylphenidate (Concerta)	8-12 hours	18 - 72	Once daily	Must be swallowed whole. Inert portion of tablet may appear in stool
Methylphenidate (Quillivant XR)	8-12 hours	10-60	Once daily	Must be reconstituted with water.
dexmethylphenidate (Focalin XR) - capsule	12 hours	5 - 40	Once daily	Can sprinkle on food as long as Bead swallowed whole
amphetamine salts (Adderall XR) - capsule	10-12 hours	5 - 60	Once daily	Can sprinkle on food as long As bead swallowed whole
lisdexamfetamine (Vyvanse)	10-12 hours	20 - 70	Once Daily	Can be dissolved in water to drink immediately

** not to be ingested with citric products*

ALPHA-ADRENERGIC AGONIST

A. Clinical Indications For Use:

1. Attention-Deficit/Hyperactivity Disorder
2. agitation, impulsive aggression, impulsivity
3. Tic D/O
4. PTSD

B. Frequency of Dose Change:

- No more than two (2) changes in any 7 day period.

C. Concomitant Medication Use:

1. Only one alpha-adrenergic agonist at any one time.
2. No MAO inhibitors

D. Complications & Side Effects:

1. sedation
2. decreased blood pressure
3. dizziness
4. rebound hypertension on discontinuation
5. constipation
6. headache
7. dry eyes

E. Cautions/Contraindications:

1. pregnancy & breast feeding
2. hx of cardiovascular disease and family hx of cardiovascular disease or unexplained sudden death
3. dosage adjustment for renal insufficiency

F. Medical Work-up:

1. physical exam
2. chemistry panel, CBC+differential, urinalysis
3. EKG at baseline if positive cardiac risk factors

G. Medical Follow-up:

1. weekly (or at each visit): orthostatic BP, pulse,
2. annual: physical exam, chemistry panel, CBC+differential, urinalysis
3. Repeat EKG as clinically indicated

DRUG (One common brand name is indicated for convenience. No preference is implied.)		MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS
clonidine	(Catapres)	see class	0.05 - 0.60	1-4 x/d	—	cautious use in combination with psychostimulants
	(patch, Catapres TTS-1, 2 or 3)	see class	0.10 - 0.60	1 patch/wk	— localized dermatitis fatal overdose if ingested	cautious use in combination with psychostimulants
	(extended release) Kapvay	-	0.1 – 0.4	bid	URI sxs; mood sxs irritability, sore throat, trouble sleeping (insomnia), nightmares, change in mood, and ear pain	adjunctive tx with psychostimulants
guanfacine	(Tenex)	see class	1 - 4.0	1-3 x/d	—	cautious use in combination with psychostimulants
	(Intuniv)	see class	1-4	1/d	—	adjunctive tx with psychostimulants

TRICYCLIC ANTIDEPRESSANTS*

A. Clinical Indications For Use:

1. depressive disorders**
2. ADHD **
3. anxiety disorders
4. enuresis ***

B. Frequency of Dose Change:

- No more than two (2) changes in any 7 day period

C. Concomitant Medication Use:

augment with MAOI only if documented failure of single agent

D. Complications & Side Effects:

1. sedation, dizziness, syncope
2. urinary retention, constipation, blurry vision, dry mouth
3. psychosis, mania, delirium
4. EKG changes
5. ↓ seizure threshold
6. wt gain

E. Cautions/Contraindications:

1. heart block
2. allergy to drug/class cross sensitivity
3. narrow angle glaucoma
4. seizure disorder
5. pregnancy & breast feeding
6. overdose may be lethal

F. Medical Work-up:

1. physical exam (incl. HT, WT, BP, P,)
2. lab: chemistry panel, CBC+differential, UA
3. EKG at baseline
4. TSH

G. Medical Follow-up:

1. annual: PE, chemistry panel, CBC+differential, UA
2. EKG at steady state after each dose increase
3. Pulse, blood pressure at each visit
4. qweek contact for first 4 wks, then q2wk x 4wks, then at 12 wks, and then when clinically indicated (dosage change, clinical worsening)

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
imipramine (Tofranil)	see class	5 - 300	1-4 x/d	Most well-studied for enuresis in low doses
desipramine (Norpramin)	see class	10 - 300	1-4 x/d	Most well-studied for ADHD, sudden death reported
amitriptyline (Elavil)	see class	2.5 - 300	1-4 x/d	High sedation, dry mouth and constipation
nortriplyline (Pamelor)	see class	10 - 150	1-4 x/d	Least orthostasis, therapeutic blood level 50-150 ng/ml
doxepin (Sinequan)	see class	10 - 300	1-4 x/d	Highest antihistamine effects
clomipramine (Anafranil)	see class + OCD	25 - 250	1-4 x/d	Do not use with MAOI; only TCA effective for OCD. Give w/ food to minimize GI upset

* *Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults when first started. Depression and other serious mental illnesses are the most important causes of suicidal thoughts and actions.*

*** generally not considered first line treatment*

**** imipramine, amitriptyline*

SEROTONERGIC ANTIDEPRESSANTS*

A. Clinical Indications For Use:

1. depressive disorders
2. obsessive compulsive disorder
3. anxiety disorders
4. bulimia, binge eating disorder
5. impulsive aggression

B. Frequency of Dose Change:

- No more than two (2) changes in any 14-day period

C. Concomitant Medication Use:

1. washout period before starting MAOI
   - 5 weeks after fluoxetine
   - 2 weeks after sertraline, fluvoxamine, citalopram
   - 1 week after paroxetine
2. no tryptophan
3. Drug interactions (CYP enzyme and related pharmacokinetics)

D. Complications & Side Effects:

1. agitation, restlessness
2. bipolar (Manic) switching
3. withdrawal symptoms on discontinuation
4. serotonergic syndrome
5. obesity
6. headache
7. sweating
8. sleep disturbance
9. gastrointestinal problems
10. sexual dysfunction

E. Cautions/Contraindications:

1. allergy to drug
2. liver failure
3. pregnancy, breast feeding
4. do not use with MAOI's

F. Medical Work-up:

1. physical exam (incl. HT, WT, BP, P,)
2. lab: chemistry panel, CBC+differential, UA
3. TSH or thyroid studies

G. Medical Follow-up:

- Close monitoring after initiation and dosage change for 3-6 months
- Q 2 months
- annual: PE, chemistry panel, CBC+differential, UA

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	SPECIAL CONSIDERATIONS
fluoxetine (Prozac)	see class	5 - 90	1 x/d	Most activating, dose in am High drug interaction risk
sertraline (Zoloft)	see class	12.5 - 200	1-2 x/d	Moderate drug interaction risk, dose in am or pm
paroxetine (Paxil)	see class	5 - 60	1-2 x/d	Higher propensity for suicidality, high risk of serotonin withdrawal
fluvoxamine (Luvox)	see class	25 - 300	1-2 x/d if >100mg/d	Dose at bedtime for improved tolerability, high drug interaction risk
citalopram (Celexa)	see class	5 - 40	1 x/d	Low drug interaction risk, dose in am or pm; > 40 mg QT prolongation risk increases
escitalopram (Lexapro)	see class	5 - 20	1 x/d	Low drug interaction risk, dose in am or pm

***Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults during initiation. Higher initial starting doses pose a greater risk of suicidality compared to lower initial starting doses (1% vs 0.5%). Depression and other serious mental illnesses are the most important causes of suicidal thoughts and actions.*

OTHER ANTIDEPRESSANTS*

A. Clinical Indications For Use:
1. depressive disorders
2. ADHD (bupropion)
3. anxiety disorders

B. Frequency of Dose Change:
- ♦ No more than two (2) changes in any 7 day period

C. Concomitant Medication Use:
- ♦ use with MAOI only if documented failure of single agent

D. Complications & Side Effects:
1. sedation
2. dizziness, syncope

E. Cautions/Contraindications:
1. allergy to drug
2. uncontrolled seizure disorder (Wellbutrin)
3. eating disorder or active drug/etoh abuse (Wellbutrin)
4. MAOI use (except trazodone)

F. Medical Work-up:
1. physical exam (incl. HT, WT, BP, P,)
2. lab: chemistry panel, CBC+differential, UA

G. Medical Follow-up:
1. annual: PE, chemistry panel, CBC+differential, UA

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	SPECIAL CONSIDERATIONS
venlafaxine (Effexor)	depression Anxiety disorders	12.5 – 225	1-3 x/d	Nausea, sustained hypertension (regular monitoring of BP recommended)	Serotonin discontinuation syndrome Higher propensity for suicidality
trazodone (Desyrel)	depression Insomnia anxiety	25 - 400	1-2 x/d	Priapism in males orthostatic hypotension, dizziness, sedation, constipation	Fluoxetine and paroxetine can increase blood level, increasing side effects
bupropion (Wellbutrin) bupropion SR, bupropion XL	depression	IR: 75 - 450 Max/dose SR: 100 - 400 Max/dose XL: 150 - 400	1-3 x/d	Agitation, headache, insomnia, ↓ seizure threshold more than most	Take early in day to prevent insomnia
mirtazapine (Remeron)	depression	7.5 - 60	1 x/d	Rare-agranulocytosis, weight gain, hyperlipidemia	7.5 mg strength not available as oral disintegrating tablet, low drug interaction risk

Antidepressants may increase suicidality (thoughts or behaviors) in children, teenagers and young adults when first started. Depression and other serious mental illnesses are the most important causes of suicidal thoughts and actions.

MOOD STABILIZER - lithium

A. Clinical Indications For Use:

1. bipolar disorder
2. schizoaffective disorder
3. impulsive aggression
4. depression (as adjunctive treatment when antidepressant med alone is not effective)

B. Frequency of Dose Change:

- See F.2.

C. Concomitant Medication Use:

1. no common rules
2. chronic non-steroidal anti-inflammatory drugs usage can increase blood drug level
3. cautious use of diuretic medication, colchicine

D. Signs of Toxicity:

- lethargy, stupor, confusion, delirium

E. Medical Work-up:

1. physical exam (incl. Ht & Wt, BP)
2. chemistry panel, CBC+differential, urinalysis
3. creatinine level & thyroid panel
4. consider EKG with multiple medications and relevant hx and medical conditions

F. Medical Follow-up:

1. each visit: WT, BP, P
2. serum levels 5-7 days after each dosage change then monthly for 1-2 months
3. annual: PE, chemistry panel, CBC+differential, UA
4. repeat EKG after stabilization

DRUG (One common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CONTRAINDICATIONS	SPECIAL MEDICAL FOLLOW-UP
lithium	150 – 2100 maximum serum level of 1.5 mEq/L	1-3 x/d	polyuria, polydipsia, tremor, EPS, nausea, diarrhea, vomiting, ataxia, ↑ WBC dysarthria, change in thyroid & renal function, weight gain	1.BUN > 50, serum creatinine level > than 1.5, dehydration, renal, cardiovascular or thyroid disease, 2.use of diuretic medication. 3.salt free diet	1.at least q6 mos: TSH 2.annual: U/A; serum creatinine

Lithium citrate syrup or solution: sugar-free, raspberry flavored, alcohol 0.3%

MOOD STABILIZER – anticonvulsants

A. Clinical Indications For Use:

1. bipolar disorder
2. schizoaffective disorder
3. impulsive aggression

B. Frequency of Dose Change:

- ♦ No more than one change in any 7 day period.

C. Concomitant Medication Use:

- ♦ no common rules

D. Complications & Side Effects:

- ♦ lethargy, stupor, confusion, delirium, weight gain except lamotrigine and topiramate

E. Cautions/Contraindications:

1. pregnancy & breast feeding
2. myelosuppression
3. hepatic disease
4. risk of Stevens-Johnson syndrome (lamotrigine, valproic acid, carbamazepine, and oxcarbazepine)
5. monitor for suicidality &/or depression

F. Medical Work-up:

1. physical exam (incl. Ht & Wt, BP, dyskinetic movements)
2. chemistry panel, CBC+differential, urinalysis
3. EKG with CBZ

G. Medical Follow-up:

1. each visit: WT, BP, P, dyskinesias
2. annual: PE, chemistry panel, CBC+differential, UA

DRUG (One common brand name is indicated for convenience. No preference is implied.)	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CONTRAINDICATIONS	SPECIAL MEDICAL FOLLOW-UP
carbamazepine (CBZ) (Tegretol) (Equetro) (Carbatrol)	100 - 1200 and/or serum level max 12 mg/ml	2-4 x/d	1.syncope, ataxia, dysarthria, ↑ liver enzymes, bone marrow ↓, skin rash, EKG changes, dizziness, drowsiness, nausea 2.induces liver enzymes 3.(↑ hepatic metabolism esp. estrogen)	1.use of MAOI in last 2 wks 2.history of glaucoma or Sjogren's disease 3.hypersensitivity to TCA 4.MI in last 6 wks 5.hx of severe ↑or ↓ BP	1.serum level 5-7 days after dose change 2.q3mos: CBC, + diff & liver enzymes 3.CBC, + diff & liver enzymes if rash, sore throat or fever
valproic acid (VPA) Divalproex sodium (Depakote, Depakote ER)**	125 – 2500 or max serum level max of 125 μg/ml	2-4 x/d	nausea, vomiting, headache, sleep/appetite changes, sedation, tremor, rash, ataxia, visual disturbance, obesity, polycystic ovary disease, fatal pancreatitis, thrombocytopenia	1.congenital metabolic d/o 2.aspirin\barbiturate use 3.age < 2 y/o	1.serum level 5-7 days after dose change 2.q3mos.: CBC, + diff & liver enzymes
lamotrigine* □ (Lamictal)	12.5 – 400	1-2 x/d	benign rash, headache, stomachache, ↑appetite, insomnia; aseptic meningitis (rare)		Special consideration: carefully adjust valproate/lamotrigine combination, see appendix

** *Depakote ER produces 10-20% lower blood levels than regular valproic acid - Depakene syrup alcohol free but not sugar free*
Optimal blood draw time for Depakote is 12 hours post-dose - Optimal blood draw time for ER is 20-24 hours post-dose

□ *Depression (as adjunctive treatment when antidepressant medication alone is not effective)*

ANXIOLYTIC

A. Clinical Indications For Use:

1. short term: relief of anxiety & some sleep disorders
2. acute alcohol withdrawal
3. older adolescents: anxiety, tension, muscle relaxation, sleep disorders
4. younger children: pavor nocturnis, somnambulism

B. Frequency of Dose Change:

1. acute care: daily or with each dose
2. long term Rx: adjust every 4 days

C. Concomitant Medication Use:

1. potentiated by: phenothiazines, opiates, barbiturates, MAOI's, TCA's, cimetidine
2. potentiate: hypnotics, sedatives, alcohol
3. half-life extended by: renal disease, hepatic disease, oral contraceptives, cimetidine, obesity

D. Complications & Side Effects:

1. CNS depression: fatigue, drowsiness, ataxia, confusion, respiratory depression, death
2. paradoxical: dyscontrol, disinhibition, excitation, ↑ anxiety, ↑ aggression, rage reaction, hallucinations, insomnia, nightmares

E. Cautions/Contraindications:

1. substance abuse or dependency
2. pregnancy

F. Medical Work-up:

1. physical exam (incl. HT, WT, BP, P,)
2. lab: chemistry panel, CBC+differential,

G. Medical Follow-up:

annual PE, SMA, CBC

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CONTRAINDICATIONS
clonazepam (Klonopin) *	see class	0.125 - 3	1-2 x/d	see class	see class
alprazolam (Xanax) **	see class	0.25 - 4	3-4 x/d	see class & increased risk of rebound and withdrawal reactions	see class
lorazepam (Ativan) **	severe adjustment d/o agitation, anxiety	0.25 - 6	3-4 x/d	see class & increased risk of rebound and withdrawal reactions	see class
buspirone (Buspar)	anxiety, aggression	2.5 - 90	3-4 x/d		

* long acting

** short acting

MISCELLANEOUS MEDICATIONS

HYPNOTIC

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
zolpidem (Ambien, CR)*	insomnia (on a short-term basis)	5-10 (Ambien) (CR, 6.25-12.5)	bedtime	paradoxical agitation, amnesia, parasomnia, perceptual disturbances	increasing sedation with other sedating agents
melatonin	insomnia	0.25 - 10	bedtime	dizziness, headaches, intense dreams, abdominal pain	other sedating agents

BETA-ADRENERGIC BLOCKER

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
propranolol (Inderal)	aggression anxiety PTSD	10 – 40	1-4 x/d	hypotension bradycardia depression	Bronchospastic disease, Cardiovascular disease, Diabetes, MAOI, Hypothyroidism

OPIATE BLOCKER

DRUG (One common brand name is indicated for convenience. No preference is implied.)	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
naltrexone (Vivitrol, Revia)	self-injurious behavior in MR & autism	25 – 50	1 x/d	sedation	liver dysfunction, concurrent opiate

SELECTIVE NOREPINEPHRINE REUPTAKE INHIBITOR

DRUG	MAIN INDICATIONS	DOSE (mg/d)	DOSAGE SCHEDULE	ADVERSE EFFECTS	CAUTIONS/ CONTRAINDICATIONS
atomoxetine (Strattera)	ADHD	10 – 100	1-2 x/d	decreased appetite, gastrointestinal sx, palpitations, mood swings, rare hepatoxicity	MAOI's, pressor agents, albuterol, narrow angle glaucoma

**may be considered after failed trials of diphenhydramine, primarily for older adolescents.*

APPENDIX

PHARMACOKINETIC DRUG INTERACTIONS - P450 CYP ENZYME METABOLIZING SYSTEM*

- Substrate: a psychotropic drug that is metabolized by a P450 CYP isoenzyme
- Inhibitor: coadministration of this drug and any substrate in isoenzyme (3A4, 2D6, 1A2) category would result in ↑ substrate levels
- Inducer: coadministration of this drug and any substrate in isoenzyme (3A4, 2D6, 1A2) category would result in ↓ substrate levels

3A4			2D6			1A2		
Substrate	**Inhibitor**	**Inducer**	**Substrate**	**Inhibitor**	**Inducer**	**Substrate**	**Inhibitor**	**Inducer**
alprazolam	fluoxetine	phenobarbital	aripiprazole	bupropion	carbamazepine	amitriptyline	cimetidine	phenobarbital
aripiprazole	fluvoxamine	phenytoin	atomoxetine	cimetidine	phenobarbital	caffeine	ciprofloxacin	phenytoin
carbamazepine	*grapefruit juice*	rifampin	clozapine	duloxetine	phenytoin	clomipramine	duloxetine	rifampin
clonazepam	macrolide	ritonavir	dextroamphetamine	fluoxetine	rifampin	clozapine	fluoxetine	ritonavir
eszopiclone	nefazodone	*smoking*	duloxetine	haloperidol	ritonavir	desipramine	fluvoxamine	*smoking*
guanfacine	ritonavir	St. John's wort	haloperidol	paroxetine		diazepam	*grapefruit juice*	
nefazodone			mixed amphetamine salts	ritonavir		haloperidol	isoniazid	
olanzapine			risperidone	sertraline		imipramine	levofloxacin	
quetiapine			TCA	TCA			sertraline	
ritonavir			trazodone					
sertraline			venlafaxine					
trazodone								
zaleplon								
ziprasidone								
zolpidem								

Other Common Mood Stabilizer Pharmacokinetic Drug interactions		
Interacting drugs	**Mechanism**	**Recommendation**
lamotrigine & valproate	valproate inhibits glucuronidation	Give ½ lamotrigine dose: monitor more closely for rash.
valproate & aspirin	aspirin ↑ free valproate levels	Give acetaminophen instead of aspirin.
lithium & NSAID	NSAID ↓ clearance of lithium	Give acetaminophen instead of NSAID.

* Partial List

INDEX

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